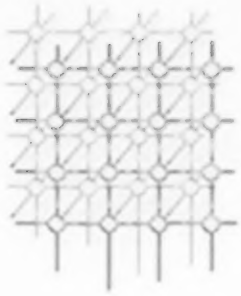

CONCURRENCY
AND COMPUTATION
PRACTICE & EXPERIENCE

CONTENTS

Volume 23 Number 1 January 2011

Parallel implementations of the False Nearest Neighbors method for distributed memory architectures
I. Marín Carrión, E. Arias Antúnez, M. M. Artigao Castillo and J. J. Miralles Canals 1

JEL: unified resource tracking for parallel and distributed applications
N. Drost, R. V. van Nieuwpoort, J. Maassen, F. Seinstra and H. E. Bal 17

Scalability of pseudospectral methods for geodynamo simulations
C. J. Davies, D. Gubbins and P. K. Jimack 38

Control and data flow compatibility in the interaction between dynamic business processes
M. J. Ibáñez, P. Álvarez, J. Á. Bañares and J. Ezpeleta 57

How to reduce packet dropping in a bufferless NoC
C. Gómez, M. E. Gómez, P. López and J. Duato 86

Optimizing Gaussian filtering of volumetric data using SSE
A. Vaško and M. Šrámek 100

A conservative strategy to protect P2P file sharing systems from pollution attacks
M. P. Barcellos, L. P. Gaspary, W. L. de Costa Cordeiro and R. S. Antunes 117

Volume 23 Number 2 February 2011

Special Issue
Euro-Par 2009

Editorial
L. Bougé and C. Lengauer 143

Energy-aware scheduling of bag-of-tasks applications on master–worker platforms
J.-F. Pineau, Y. Robert and F. Vivien 145

POGGI: generating puzzle instances for online games on gridi nfrastructures
A. Iosup 158

Wavelet-adaptive solvers on multi-core architectures for the simulation of complex systems
D. Rossinelli, B. Hejazialhosseini, M. Bergdorf and P. Koumoutsakos 172

StarPU: a unified platform for task scheduling on heterogeneous multicore architectures
C. Augonnet, S. Thibault, R. Namyst and P.-A. Wacrenier 187

NIC-assisted cache-efficient receive stack for message passing over Ethernet
B. Goglin 199

Optimizing communication for Charm ++ applications by reducing network contention
A. Bhatelé, E. Bohm and L. V. Kalé 211

Volume 23 Number 3 10 March 2011

Special Issue
IWPLS 2009

Special Issue: Portals for life sciences—Providing intuitive access to bioinformatic tools
S. Gesing, J. van Hemert, P. Kacsuk and O. Kohlbacher 223

P-GRADE portal family for grid infrastructures
P. Kacsuk 235

Generating web-based user interfaces for computational science
J. van Hemert, J. Koetsier, L. Torterolo, I. Porro, M. Melato and R. Barbera 246

Ion permeation simulations by Gromacs—an example of high performance molecular dynamics
J. Krüger and G. Fels 259

A grid portal with robot certificates for bioinformatics phylogenetic analyses
R. Barbera, G. Andronico, G. Donvito, A. Falzone, J. J. Keijser, G. La Rocca, L. Milanesi, G. P. Maggi and S. Vicario 272

Portals for collaborative research communities: two distinguished case studies
I. Elsayed, G. Madey and P. Brezany 282

Volume 23 Number 4 25 March 2011

The scalable process topology interface of MPI 2.2
T. Hoefler, R. Rabenseifner, H. Ritzdorf, B. R. de Supinski. R. Thakur and J. L. Träff 293

Design, implementation and evaluation of a virtual storage system
H. H. Huang and A. S. Grimshaw 311

Performance analysis of single-phase, multiphase, and multicomponent lattice-Boltzmann fluid flow simulations on GPU clusters
J. Myre, S. D. C. Walsh, D. Lilja and M. O. Saar 332

Image processing applications performance study on Cell BE and Blue Gene/L
A. A. El-Moursy and F. N. Sibai 351

Efficient mapping and acceleration of AES on custom multi-core architectures
A. Pande and J. Zambreno 372

ISENGARD: an infrastructure for supporting e-science and grid application development
D. Kurniawan and D. Abramson 390

Dynamic software updates for parallel high-performance applications
D. K. Kim, E. Tilevich and C. J. Ribbens 415

Volume 23 Number 5 10 April 2011

Special Issue
Computational Science and Its Applications ICCSA

Editorial
O. Gervasi, K. C. J. Tan, M. Gavrilova and D. Taniar 435

A framework for modeling and supporting data transformation services over data and knowledge grids with real-time bound constraints
A. Cuzzocrea 436

Grid and P2P middleware for wide-area parallel processing
F. Xhafa, S. Pllana, L. Barolli and E. Spaho 458

A scalable group communication protocol with hybrid clocks
I. Tsuneizumi, A. Aikebaier, M. Ikeda, T. Enokido and M. Takizawa 477

Constrained range search query processing on road networks
K. Xuan, G. Zhao, D. Taniar, M. Safar and B. Srinivasan 491

A context-aware semantic similarity model for ontology environments
H. Dong, F. K. Hussain and E. Chang 505

Volume 23 Number 6 25 April 2011

Analyzing behavioral properties of semantic business processes with parametric data
M. J. Ibáñez, P. Álvarez and J. Ezpeleta 525

A multi-GPU algorithm for large-scale neuronal networks
R. Y. de Camargo, L. Rozante and S. W. Song 556

Resource brokering using a multi-siteresource allocation strategy for computational grids
C.-T. Yang, F.-Y. Leu and S.-Y. Chen 573

Fault tolerance for data parallel programs
C. Bertolli and M. Vanneschi 595

A decentralized coordination method for optimal load redistribution in heterogeneous servicegrids
Y.-Y. Chen and T.-J. Wu 633

Utility functions for adaptively executing concurrent workflows
K. Lee, N. W. Paton, R. Sakellariou and A. A. A. Fernandes 646

Volume 23 Number 7 May 2011

Special Issue
GPU computing

Preface
J. R. Herrero, E. S. Quintana-Ortí and R. Strzodka 667

Stream processing on GPUs using distributed multimedia middleware
M. Repplinger and P. Slusallek 669

Fast in-place, comparison-based sorting with CUDA: a study with bitonic sort
H. Peters, O. Schulz-Hildebrandt and N. Luttenberger 681

Condensed forms for the symmetric eigenvalue problem on multi-threaded architectures
P. Bientinesi, F. D. Igual, D. Kressner, M. Petschow and E. S. Quintana-Ortí 694

Accelerating cardiac excitation spread simulations using graphics processing units
B. M. Rocha, F. O. Campos, R. M. Amorim, G. Plank, R. W. dos Santos, M. Liebmann and G. Haase 708

Volume 23 Number 8 10 June 2011

Performance-based parallel loop self-scheduling using hybrid OpenMP and MPI programming on multicore SMP clusters
C.-T. Yang, C.-C. Wu and J.-H. Chang 721

Quality of Service on Grid: architectural and methodological issues
A. Merlo, A. Clematis, A. Corana and V. Gianuzzi 745

Type-safe concurrent resource sharing
L. Wittie and J. Lockhart 767

Efficient range query processing over DHTs based on the balanced Kautz tree
Y. Zhang, L. Liu, X. Luand D. Li 796

A new approach for sparse matrix vector product on NVIDIA GPUs
F. Vázquez, J. J. Fernández and E. M. Garzón 815

Optimizing layer-based scheduling algorithms for parallel tasks with dependencies
R. Kunis and G. Rünger 827

Bayesian intelligent semantic mashup for tourism
W. Wang, G. Zeng and D. Tang 850

Volume 23 Number 9 25 June 2011

Special Issue
Semantics, Knowledge and Grids

Editorial
X. Sun and X. Dong 863

Building decentralized resource space on a structured P2P network
X. Chen and J. Zhang 866

Assessing service protocol adaptability based on protocol reduction and graph search
Z. Zhou, S. Bhiri, H. Zhuge and M. Hauswirth 880

Web-of-things framework for cyber–physical systems
T. S. Dillon, H. Zhuge, C. Wu, J. Singh and E. Chang 905

Basic operations, completeness and dynamicity of cyber physical socio semantic link network CPSocio-SLN
H. Zhuge and B.Xu 924

Inter connection of heterogeneous knowledge bases and its application on Knowledge Grid
T. Nakanishi, K. Zettsu, Y. Kidawara and Y. Kiyoki 940

Automatically constructing semantic link network on documents
H. Zhuge and J. Zhang 956

Cyber Physical Socio Ecology
X. Shi and H. Zhuge 972

P2P schema-mapping over network-bound XML data
C. Comito and D. Talia 985

Ontology mapping: as a binary classification problem
M. Mao, Y. Peng and M. Spring 1010

Volume 23 Number 10 July 2011

Hypercubic storage layout and transforms in arbitrary dimensions using GPUs and CUDA
K. A. Hawick and D. P. Playne 1027

Comparing programming models for medical imaging on multi-core systems
P. Kegel, M. Schellmann and S. Gorlatch 1051

Performance, optimization, and fitness: Connecting applications to architectures
M. A. Bhuiyan, M. C. Smith and V. K. Pallipuram 1066

Mining Web search engines for query suggestion
Z. Xu, X. Luo, J. Yu and W. Xu 1101

Constructing u-City of Seoul by future foresight analysis
J.-H. Woo, H. Kim, S. B. Lim, J.-J. Kim, J. Lee, R. Ryoo, H. Kim and Le Dinh Minh 1114

A model-driven approach to predicting dependability of WS-CDL based service composition
Y. Xia, G. Dai, J. Li, T. Sun and Q. Zhu 1127

A distributed evolutionary approach for multisite mapping on grids
I. De Falco, U. Scafuri and E. Tarantino 1146

Volume 23 Number 11 10 August 2011

Biomashups: the new world of exploratory bioinformatics?
J. M. Hogan, J. Sumitomo, P. Roe and F. Newell 1169

An open and scalable architecture for delivering 3D shared visualization services to heterogeneous devices
G. Paravati, A. Sanna, F. Lamberti and L. Ciminiera 1179

A survey on software checkpointing and mobility techniques in distributed systems
S. Marzouk and M. Jmaiel 1196

Performance analysis of job dissemination techniques in Grid systems
D. Bruneo, F. Longo, M. Scarpa and A. Puliafito 1213

Fine tuning of the multiplexing facilities of Java's Remote Method Invocation
P. Basanta-Val, M. García-Valls, I. Estévez-Ayres and J. Fernández-González 1236

Data flow detection and applications to workflow scheduling
Y. Wang and P. Lu 1261

Parallel isosurface extraction for 3D data analysis workflows in distributed environments
D. D'Agostino, A. Clematis and V. Gianuzz 1284

Volume 23 Number 12 25 August 2011

NSS 2009 Special Issue on Building Secure Parallel and Distributed Networks and Systems

Editorial
Y. Xiang, J. Lopez, H. Wang and W. Zhou 1311

Specifying and enforcing the principle of least privilege in role-based access control
X. Ma, R. Li, Z. Lu, J. Lu and M. Dong 1313

Architecture design of high-efficient and non-memory AES crypto-core for WPAN
R.-J. Chen, J.-J. Lin, S.-M. Hung, J.-L. Lai and S.-J. Horng 1332

Secure mobile agents with controlled resources
Q. Zhang, Y. Mu, M. Zhang and R. H. Deng 1348

Self-similar characteristics of network intrusion attempts and the implications for predictability
A. Wahid, C. Leckie and C. Zhou 1367

A generic framework for constructing cross-realm C2C-PAKA protocols based on the smart card
J. Xu, W.-T. Zhu and W.-T. Jin 1386

A cryptographically *t*-private auction system
M. Hinkelmann, A. Jakoby, N. Moebius, T. Rompf and P. Stechert 1399

A secure and efficient data aggregation scheme for wireless sensor networks
W. T. Zhu, F. Gao and Y. Xiang 1414

Secure SCADA framework for the protection of energy control systems
C. Alcaraz, J. Lopez, J. Zhou and R. Roman 1431

Achieving fine-grained access control for secure data sharing on cloud servers
G. Wang, Q. Liu and J. Wu 1443

Volume 23 Number 13 10 September 2011

Offline enforcement of contracts for high-performance computing
K. Damevski 1465

Elastic management of web server clusters on distributed virtual infrastructures
R. Moreno-Vozmediano, R. S. Montero and I. M. Llorente 1474

Power-aware provisioning of virtual machines for real-time Cloud services
K. H. Kim, A. Beloglazov and R. Buyya 1491

Zorilla: a peer-to-peer middleware for real-world distributed systems
N. Drost, R. V. van Nieuwpoort, J. Maassen, F. J. Seinstra and H. E. Bal 1506

Scalable parallel regridding algorithms for block-structured adaptive mesh refinement
J. Luitjens and M. Berzins 1522

Parallel unmixing of remotely sensed hyperspectral images on commodity graphics processing units
S. Sánchez, A. Paz, G. Martín and A. Plaza 1538

Brokering of risk-aware service level agreements in grids
K. Djemame, J. Padgett, I. Gourlay and D. Armstrong 1558

A model-based development approach for the verification of real-time Java code
N. Hakimi Pour, P. Strooper and A. Wellings 1583

Volume 23 Number 14 25 September 2011

Special Issue
JTRES 2009

Editorial
M. Schoeberl and M. T. Higuera-Toledano 1607

Applying fixed-priority preemptive scheduling with preemption threshold to asynchronous event handling in the RTSJ
M. Kim and A. Wellings 1609

Extending the concurrency model of the real-time specification for Java
P. Basanta-Val, M. García-Valls and I. Estévez-Ayres 1623

Replicating real-time garbage collector
T. Kalibera 1646

Quantitative dynamic-memory analysis for Java
D. Garbervetsky, S. Yovine, V. Braberman, M. Rouaux and A. Taboada 1665

A family of real-time Java benchmarks
T. Kalibera, J. Hagelberg, P. Maj, F. Pizlo, B. Titzer and J. Vitek 1679

Volume 23 Number 15 October 2011

Design and implementation of an adaptive job allocation strategy for heterogeneous multi-cluster computing systems
C.-T. Yang, K.-Y. Chou and K.-C. Lai 1701

Towards automated HPC scheduler configuration tuning
D. Krishnamurthy, M. Alemzadeh and M. Moussavi 1723

Flexible and efficient profiling with aspect-oriented programming
W. Binder, D. Ansaloni, A. Villazón and P. Moret 1749

Finding frequent items in parallel
M. Cafaro and P. Tempesta 1774

Scalability and locality of extrapolation methods on large parallel systems
M. Korch, T. Rauber and C. Scholtes 1789

A hybrid approach for selecting service-based real-time composition algorithms in heterogeneous environments
I. Estévez-Ayres, M. García-Valls, P. Basanta-Val and J. Díez-Sánchez 1816

Volume 23 Number 16 November 2011

Special Issue
Fourth International Workshop on Workflow Management (ICWM 2009)

Editorial
J. Chen and L. Wang 1853

eMOLST: a documentation flow for distributed health informatics
G. von Laszewski, J. Dayal and L. Wang 1857

Autonomic streaming pipeline for scientific work flows
R. Tolosana-Calasanz, J. A. Bañares and O. F. Rana 1868

A probabilistic strategy for temporal constraint management in scientific workflow systems
X. Liu, Z. Ni, J. Chen and Y. Yang 1893

Simulating Tavern a workflows using stochastic process algebras
V. Curcin, P. Missier and D. DeRoure 1920

A data-operation model based on partial vector space for batch processing in workflow
J. Liu, Y. Wen, T. Li and X. Zhang 1936

A QoS-aware exception handling method in scientific workflow execution
L. Qi, W. Lin, W. Dou, J. Jiang and J. Chen 1951

The interplay of resource provisioning and workflow optimization in scientific applications
G. Singh and E. Deelman 1969

A taxonomy and survey on autonomic management of applications in grid computing environments
M. Rahman, R. Ranjan, R. Buyya and B. Benatallah 1990

Tabu search heuristics for workflow resource allocation simulation optimization
Y. Yu, M. Pan, X. Li and H. Jiang 2020

Access control and authorization for protecting disseminative information in E-learning workflow
L. Sun and H. Wang 2034

Volume 23 Number 17 10 December 2011

Special Issue
Middleware Strategies for Clouds and Grids in e-Science

Editorial
B. Schulze and J. Myers 2043

Performance and deployment evaluation of a parallel application on a private Cloud
G. V. Mc Evoy, B. Schulze and E. L. M. Garcia 2048

Configuring large-scale storage using a middleware with machine learning
D. M. Eyers, R. Routray, R. Zhang, D. Willcocks and P. Pietzuch 2063

Adaptive fault tolerance mechanisms for opportunistic environments: a mobile agent approach
V. G. Pinheiro, A. Goldman and F. Kon 2078

An approach to enhance the efficiency of opportunistic grids
R. de Aquino Gomes and F. M. Costa 2092

Semantic middleware for e-Science knowledge spaces
J. Futrelle, J. Gaynor, J. Plutchak, J. D. Myers, R. E. McGrath, P. Bajcsy, J. Kastner, K. Kotwani, J. S. Lee, L. Marini, R. Kooper, T. McLaren and Y. Liu 2107

A proposal to apply inductive logic programming to self-healing problem in grid computing: How will it work?
M. Ferro, A. R. Mury and B. Schulze 2118

Volume 23 Number 17 10 December 2011

Special Issue
Euro-Par 2010

Editorial
L. Bougé and C. Lengauer 2137

Meeting subscriber-defined QoS constraints in publish/subscribe systems
M. A. Tariq, B. Koldehofe, G. G. Koch, I. Khan and K. Rothermel 2140

A liveness condition for concurrent objects: x-wait-freedom
D. Imbs and M. Raynal 2154

Active optimistic and distributed message logging for message-passing applications
T. Ropars and C. Morin 2167

Computing subdominant unstable modes of turbulent plasma with a parallel Jacobi–Davidson eigensolver
E. Romero and J. E. Roman 2179

Fault-tolerant on-board computing for robotic space missions
H. P. Zima, M. L. James and P. L. Springer 2192

Scalable multicore architectures for long DNA sequence comparison
F. Sánchez, F. Cabarcas, A. Ramirez and M. Valero 2205

Multi-organization scheduling approximation algorithms
J. Cohen, D. Cordeiro, D. Trystram and F. Wagner 2220

Cost-effective queue schemes for reducing head-of-line blocking in fat-trees
J. Escudero-Sahuquillo, P. J. Garcia, F. J. Quiles, J. Flich and J. Duato 2235

Volume 23 Number 17 10 December 2011

Special Issue
Emerging Computational Methods for the Life Sciences

Editorial
J. Qiu 2249

An experience report: porting the MG-RAST rapid metagenomics analysis pipeline to the cloud
A. Wilke, J. Wilkening, E. M. Glass, N. L. Desai and F. Meyer 2250

Optimization of a parallel permutation testing function for the SPRINT R package
S. Petrou, T. M. Sloan, M. Mewissen, T. Forster, M. Piotrowski, B. Dobrzelecki, P. Ghazal, A. Trew and J. Hill 2258

Parallel pairwise statistical significance estimation of local sequence alignment using Message Passing Interface library
A. Agrawal, S. Misra, D. Honbo and A. Choudhary 2269

Graphics processing unit-based triangulations of Blinn molecular surfaces
S. E. D. Dias and A. J. P. Gomes 2280

Energy landscape analysis for regulatory RNA finding using scalable distributed cyberinfrastructure
J. Kim, W. Huang, S. Maddineni, F. Aboul-ela and S. Jha 2292

Biocompute 2.0: an improved collaborative workspace for data intensive bio-science
R. Carmichael, P. Braga-Henebry, D. Thain and S. Emrich 2305

Browsing large-scale cheminformatics data with dimension reduction
J. Y. Choi, S.-H. Bae, J. Qiu, B. Chen and D. Wild 2315

Many task computing for orthologous genes identification in protozoan genomes using Hydra
F. Coutinho, E. Ogasawara, D. de Oliveira, V. Braganholo, A. A. B. Lima, A. M. R. Dávila and M. Mattoso 2326

Cloud computing paradigms for pleasingly parallel biomedical applications
T. Gunarathne, T.-L. Wu, J. Y. Choi, S.-H. Bae and J. Qiu 2338

Multilevel text mining for bone biology
O. Tilak, A. Hoblitzell, S. Mukhopadhyay, Q. You, S. Fang, Y. Xia and J. Bidwell 2355

Volume 23 Number 18 25 December 2011

Design and implementation of an efficient integer count sort in CUDA GPUs
V. Kolonias, A. G. Voyiatzis, G. Goulas and E. Housos 2365

Device level communication libraries for high-performance computing in Java
G. L. Taboada, J. Touriño, R. Doallo, A. Shafi, M. Baker and B. Carpenter 2382

Moving huge scientific datasets over the Internet
W. Liu, B. Tieman, R. Kettimuthu and I. Foster 2404

DENEB: a platform for the development and execution of interoperable dynamic Web processes
J. Fabra, P. Álvarez, J. A. Bañares and J. Ezpeleta 2421

Parallel terrain visibility calculation on the graphics processing unit
D. Strnad 2452

Parallelization and performance comparison of the conjugate gradient equation solver on multicore Cell and Xeon computers
F. N. Sibai, M. Saad and H. K. Kidwai 2463

Gibraltar: A Reed-Solomon Coding Library for Storage Applications on Programmable Graphics Processors
M. L. Curry, A. Skjellum, H. L .Ward and R. Brightwell 2477

Measuring semantic similarity between words by removing noise and redundancy in web snippets
Z. Xu, X. Luo, J. Yu and W. Xu 2496